How Current Are Your Endoscope Reprocessing Practices?

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Objectives

After completion of this self study activity, the learner will be able to:

1. Name three areas of the endoscopy environment that poses potential for infection control breaches.
2. Identify all areas of your facility that perform flexible endoscopy.
3. Identify where to reference materials to identify the process of reprocessing a flexible endoscope with a known leak.
4. Differentiate pre-cleaning from manual cleaning of the contaminated flexible endoscope.

Test Questions

1. Flexible endoscopes should be stored
   a. in their suitcases
   b. on the counter
   c. hanging vertically
   d. in storage room drawers
2. Contaminated flexible endoscopes should be carried
   a. isolated from other supplies
   b. covered
   c. after pre-cleaning
   d. all of the above
3. Pre-cleaning of the flexible endoscope is performed
   a. at the point of use
   b. after leakage testing
   c. in the automated endoscope disinfector
   d. before patient use
4. Leak testing is performed
   a. after every use
   b. after known or suspected trauma to the scope
   c. upon return from repair
   d. all of the above
5. Leak testing is performed
   a. in an enzymatic solution
   b. in clear water
   c. in disinfectant solution
   d. with isopropyl alcohol
6. A scope with an identified leak can be manually cleaned with a modified process.
   a. true
   b. false
7. The most important step in the reprocessing cycle is
   a. pre-cleaning
   b. leak-testing
   c. manual cleaning
   d. disinfection
8. Parameters of enzymatic solutions may include
   a. temperature
   b. exposure period
   c. concentration
   d. all the above
9. Stains on the storage area floors are indicative of
   a. residual fluid
   b. colored paint
   c. plumbing leaks
   d. spilled enzymatic cleaners

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10. Alternatives to typical care practice may need to be reviewed with
a. renovation activities
b. vacations of key staff
c. with power disruptions
d. all of the above

Introduction

Limitations of the environment of care can impact the consistent application of good infection prevention principles relative to flexible endoscopy. As managers with concern or oversight for areas including flexible endoscopy this review of frequently seen limitations may be worthy of your critical review. Without clinical advocates from infection preventionists environmental changes within the endoscopy setting may be regarded as unrecognized or unnecessary expenses. Flexible endoscopes are primarily used in the gastroenterology and pulmonary lab setting, but don't overlook the other settings that may often need an advocate for process changes. Flexible scopes and as well as semi-rigid telescopes with flexible distal tips may be found in the operating room and cardiovascular lab. Multiple services including anesthesia, colon and rectal, ENT, general, thoracic, and urology may all need your expertise in the development of practical processes.

While many aspects of flexible scope care and handling impact the function and lifespan of the scope and are addressed in other venues, infection prevention related aspects of care are just as important. The following will offer you insight into the performance of a focused review of the flexible endoscope environment of care as it may relate to infection prevention.

Endoscope Storage

Proper storage arrangements provide physical protection of endoscopes from their environment and from themselves. While storage closets may be used in some facilities, cabinets are more common. Closets or small rooms may limit or control access to scopes. Cabinets limit compression damage to the scopes from other equipment and supplies, while at the same time storing them out of range from the housekeeper's mop.

Carrying cases should not be utilized for endoscope storage in that, the lining of the carrying cases may afford a damp, dark environment for bacteria to grow.

Materials that line the wall of the cabinet or storage area should be comprised of a soft material that will not cause distal tip damage. Consideration when selecting lining materials should be toward materials that are non-porous and can endure frequent exposure to germicidal chemicals.

Keeping the reprocessed dry endoscopes in a clean environment is critical. Guidelines and recommendations from multiple professional societies encourage clean inventory to be stored in well-ventilated cabinets. Scopes should be suspended vertically to allow residual moisture to be pulled by gravity out of all channels. Removal of function valves, biopsy port covers, auxiliary port irrigation tubes, and fluid resistant caps is necessary if the internal channels are to ventilate adequately during storage.

Proper storage arrangements provide physical protection of endoscopes from their environment and from themselves.

Fiberoptic flexible endoscopes need their Ethylene Oxide (ETO) venting cap applied prior to endoscope storage to allow for easy airflow. Any fiberoptic endoscope stored without the venting cap attached should be completely cleaned and reprocessed and suspended with the venting cap in place.

Many endoscopy suites occupy areas not designed specifically for these procedures; therefore, ventilation may not be as controlled as in some newly designed areas for patient care. Consequently, space allocation has scope storage in less than optimal locations. Storage facilities in areas other than procedure rooms or decontamination areas may be more protective from a ventilation perspective. Stored endoscopes should be restricted from the flow of airborne pathogens that are pervasive among the population of patients served in patient care areas. There is a control on the release of aerosols caused by cleaning contaminated equipment when cleaning activities are performed below the fluid level of enzymatic solutions. It is important to follow this principle should it be necessary to store scopes in the reprocessing area.

Reusable spongy distal tip protectors are commonly used to protect scopes from compression damages. Should these be a part of your protocol of use, a critical review of who places the tip protectors on, and who removes them, as well as when and where these activities occur should be studied. Recontamination may occur when the person who handles these protectors is contaminated. The porous protector can then become a medium for bacteria growth. Should they be placed on the scope in a manner that occluded the internal channels, residual moisture may drain out onto these sponges and they become magnets for bacterial growth. A method of cleaning reused protectors needs to be devised before their reuse.

Fluid stains on the bottom of storage cabinets or puckered toweling lining the floors are indicative of scopes that are hung before they are completely dry. Colored fluid stains indicate residual chemicals ineffectively removed from the reprocessed scopes. These markers should alert you to review cleaning, rising and/or drying effectiveness.

Make rounds with the endoscopy manager and review the following:

- Are the cabinets ventilated?
- Is the location of clean endoscopes appropriate?
- Can the lining of the cabinets be cleaned?
- Are their fluid stains on the floor under stored endoscopes?
- Are video scopes stored with their fluid resistant caps on?
- Are there fiberoptic scopes stored with their venting caps on?
- Are distal tip protectors used appropriately?

Transportation

There are two considerations for the scope while moving it. Protecting it from compression and penetration and protecting the environment … whether it is the scope being protected from the area traveled, or the area traveled protected from the endoscope.

In order to protect the unused scope from contamination, it should be covered when traveling outside of the department. Should two scopes be planned for use on one patient, the second scope should be protected from contamination. If plans for its use change, the scope is still clean for a subsequent patient.

In order to protect the environment, when traveling outside the department, the contaminated endoscope should be housed within a container that occludes airborne and droplet type contaminants. Should reusable, hard-sided covered tubs be used they should have a single-use liner or be cleaned between uses with a hospital approved germicide. Attention should be paid to assure the chemical is appropriate and its contact time requirements are met routinely.

Carrying contaminated scopes in linens will not protect the area traveled from potential droplet types of exposure and can hide the fact that the scope's position may be unsafe. (See Figure 1.)

Make rounds with the endoscopy manager and review the following:

- What path does the scope travel to get to the decontamination area?
- What type of container is used to carry the contaminated scope?
- How are containers cleaned between uses?

Pre-cleaning

Pre-cleaning of all endoscopes is preformed for two purposes. The first of which is to protect from potential contamination the path from the procedure room to the

Figure 1. Contorted Endoscope in Linen

reprocessing area; second, to protect the scope from debris that can impede both it function and effective cleaning. All guidelines and recommendations agree that pre-cleaning should include wiping the exterior of the scope, flowing all of the channels, and containing the scope prior to moving it from the area of use.

Prior to pre-cleaning the internal channels of the scope, the exterior should be cleaned of gross contaminants by the use of a damp sponge or soft cloth. Whether using a commercial sponge impregnated with an enzymatic cleaner or a departmentally available cloth with an enzymatic cleaner, references to the safety of the product to the scope's exterior with a sustained exposure period need to be understood. Endoscope user manuals, as well as guidelines from multiple professional associations, direct the cleaner to suction fluid through the suction/biopsy channel and auxiliary channels of the scopes. This process not only removes the gross debris from this two-part internal channel, it also limits the potential for debris to dry, making effective manual cleaning more difficult and potentially less effective. Scopes containing more than one biopsy channel need to have fluid suctioned through them both.

A presoak solution, developed for stainless steel surgical instruments, is the most common inappropriately used solution. Consideration to directions for appropriate enzymatic solutions may include the dilution ratio of the chemical to water, water temperature needed to effectively activate the chemical, exposure period, and agitation of the chemical to appropriately blend the mixture. Any of the instructions not followed may render the process less effective. Not all enzymatic cleaners are microbiocidal and consequently need to be supplied freshly for each use.

The smaller air/water channel often is ignored during pre-cleaning. Its small size, angle of the distal nozzle, and retrograde force of air used for procedural insufflation's all lead to clogs by solidified debris. The principal of evacuating residual materials from this channel is by the flow of forced air through this bifurcated channel. Scope manufacturers differ in the methods of performing this process. Some scopes are to be cleaned by the use of an air/water channel cleaning adapter, others by the direction of airflow achieved by a stopcock on the water bottle.

Endoscopes with forceps raisers (some ultrasound scopes) or elevator channels should be pre-cleaned as well. (See Figure 2.) Often times an Endoscopic Retrograde Cholangeopancratography (ERCP) is performed outside of the department. By the time the scope is returned to the department for cleaning, its articulating mechanism may be clogged with thick bile and/or radiographic media leaked during the procedure. When substances dry in this area the mechanism becomes more difficult to clean.

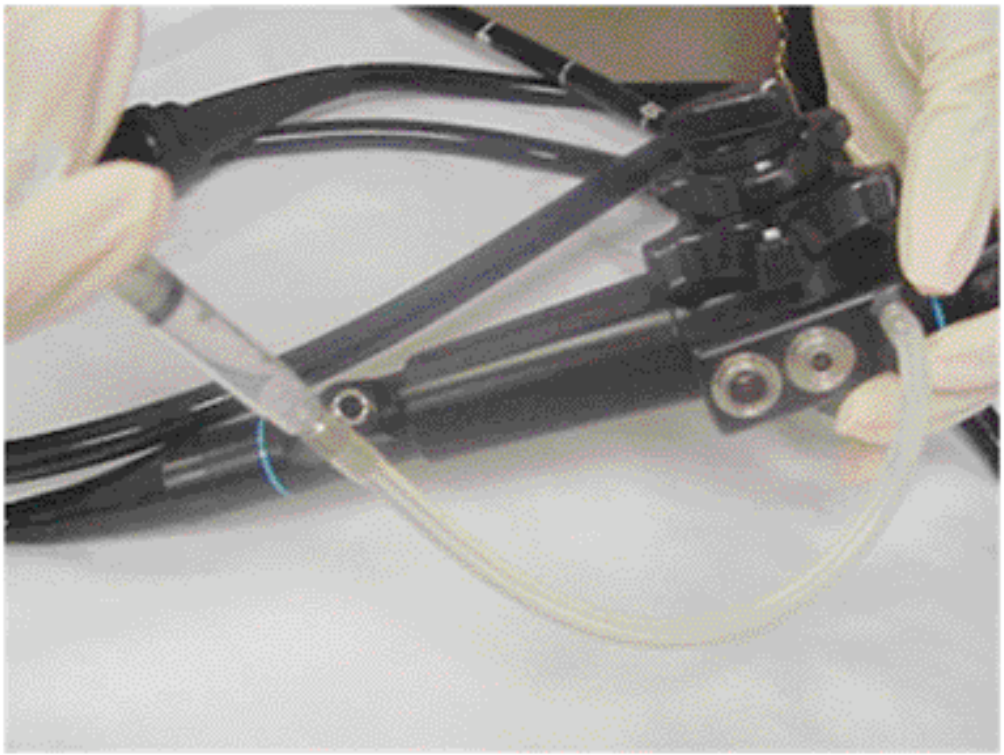


Figure 2. Auxiliary Channel of Duodenoscope

When there are multiple scopes prepared for use on one patient, the used scope should be pre-cleaned prior to disconnecting it and setting it aside. Should the used scope be detached and set aside before all channels are pre-cleaned a risk for debris drying and occluding these channels develops.

Make rounds with the endoscopy manager and review the following:

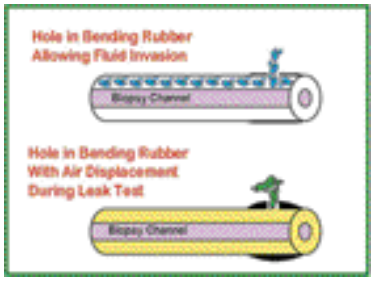
- Is adequate time allowed for pre-cleaning activities?
- Are appropriate supplies available for use?
- Is appropriate personal protective equipment (PPE) available and worn?
- Where does pre-cleaning occur?
- Is the scope's exterior wiped off?
- Is liquid aspirated through the scope's channels?
- If a chemical is used is it mixed according to label directions?
- Is the liquid kept covered?
- Is the air/water cleaning adapter/valve utilized?
- Is the forceps raiser/elevator channel irrigated?
- What is used to contain the contaminated scope when moving it?
- If multiple scopes are used, is the first one pre-cleaned prior to disconnection from the processor?

Leak Testing

Leak testing is probably the most significant proactive diagnostic process whose success or failure in performing will have major impact to the endoscope inventory. Implications can be negative or positive toward cross contamination of chemicals and bio-burden to subsequent patients. Leak tests should be performed after every use, when trauma has occurred to the scope, and/or when it returns from repair.

Modern endoscopes are airtight, allowing the interstitial cavities to be pressurized in order to observe for leakage. While the hollowness of the main structural components of the endoscope allows pressure testing to be effective, it also means that fluid entering one area of the scope can travel the entire internal scope in a short period of time. (See Figure 3.)

Figure 3. Interstitial Air Pressure/Hole in Bending Rubber



All steps of the pressure test should be performed according to the scope manufacturer's instructions for use. Should steps be minimized, omitted, or performed out of sequence a false test result may prevail. The department's repair history that includes fluid invasion is indicative of leaks that went undiscovered by the leak test.

Leak tests can be hindered when the sink in which the test is performed is too small. If the diagonal measurement is less than 24 inches, the scope may be coiled so tightly that air flow is impeded. Minimizing the observation period to less than 90 seconds can also lead to false results. A system that has insufficient water flow will also cause some employees to minimize the time of the observation in order to more quickly turn the scope around for reuse.

If personnel who typically leak test the scopes are not available at the times endoscopy is performed off hours, the competency of others to perform the leak test and reprocessing steps should be validated.

Leak testing may also be performed by some automated endoscope reprocessers or by a totally automatic leak testing unit, either of which may minimize the need for staff to leak test the endoscope.

Make rounds with the endoscopy manager and review the following:

- How many holes have been discovered by effective leak testing within the past year?
- How many scopes have had fluid invasions within the past year?
- Is there a specific staff that performs leak tests?
- Have others who may fill in for the designated staff been validated?
- Is there a poster or other type of instructions regarding leak testing posted for infrequent performers?
- Where does leak testing occur?
- What is the average length of time for the pressure test?
- Are the valves and channel covers removed?
- If used, how large are the sinks?
- Is trapped air removed prior to the evaluation?
- Are all knobs and levers activated slowly in all directions?
- Are the video switch buttons stressed in all directions?
- Has the scope taken pictures without activation?
- Has the scope not taken pictures when the button was depressed?
- Is the scope pressurized prior to placing it in water?
- Is the complete scope removed from water before the scope is depressurized?
- Are there other devices in the sink during the test?
- Is the drain cover one that can damage the scope?
- Are the fluid resistant caps left in place throughout the pressure test and subsequent reprocessing activities?
- Are fluid resistant caps in good condition?

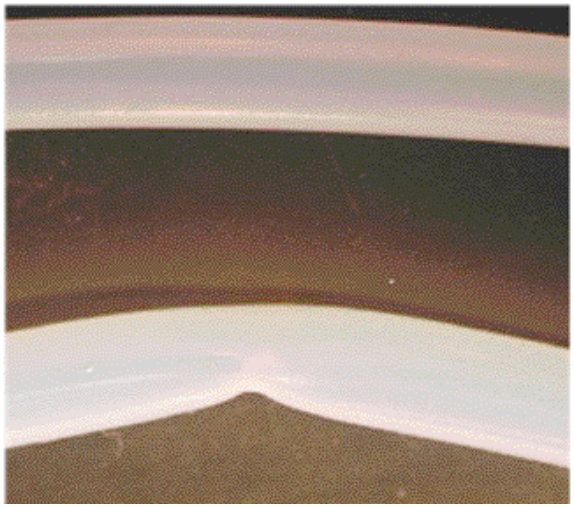
- Is the scope completely submersed during the test?
- If used, is the manometer pressurized within the designated range?
- Is there a modified process for cleaning and reprocessing a scope with a known leak?

Manual Cleaning

Manual cleaning of the flexible endoscope is the most important step in the reprocessing cycle. To successfully disinfect, all debris must first be removed. This is necessary even when the scope will be placed in an automatic endoscope reprocessing unit with a wash cycle. The process has three components that must be present if it is to be effective: brushes, chemicals and friction.

The use of an appropriately-sized cleaning brush without kinks and with soft bristles is needed to have contact on the side walls of the suction/biopsy channels so that debris can be cleared. Slow movements inserting the brush and friction while removing the brush will loosen debris that may be on both proximal and distal sides of kinks with the Polytetrafluoroethylene (PTFE) channels. (See Figure 4.)

Figure 4. Kinked Biopsy Channel



Whether using a reusable or single-use brush, a couple of considerations are imperative. First, select the brush appropriate to the size of the channel being cleaned. If the brush is too small, there will be little contact with the debris or channel wall. If the brush is too large not only may it get lodged in the channel, but the bristles may be defected upward as the brush travels the channel merely swiping the sides of the channel. Some scopes, those with pediatric or therapeutic sized channels, may need two brushes for effective cleaning of both the suction and biopsy channels.

> Manual cleaning of the flexible endoscope is the most important step in the reprocessing cycle. To successfully disinfect, all debris must first be removed.

Secondly, the condition of the brush must be assured to be safe. It the protective tip is missing, the coiling unbraided, some bristles absent, or the delivery tube (whether metal or plastic) kinked, the brush may tear a hole as it travels down the channel lumen. Because this occurs after the leakage test has been performed, the hole may go unnoticed and the subsequent patient be exposed to bio-burden and cleaning chemical retained in the scope. There is no maximal number of times each lumen should be brushed, however the minimal number should be identified as "until the brush comes out clean." A scope coiled in a configuration as large as the sink will accommodate will maximize the potential for safe brush contact as well as enzymatic solution flow. Inspect, clean and high level disinfect reusable brushes between each case; replace them if they are worn, frayed, bent or otherwise damaged.

A flow of enzymatic solutions through the suction/biopsy, air/water, and all auxiliary ports is requisite to remove the loosened debris. The enzymatic solution used should be an appropriate chemical for flexible endoscopes and all user directions for the solution need to be followed if desired outcomes are to be achieved. Consideration to directions for appropriate enzymatic solutions may include the dilution ratio of the chemical to water, temperature of water needed to effectively activate the chemical, and agitation of the chemical to appropriately blend the mixture. Any of the instructions not followed may render the process less effective. The endoscope manufacturer includes irrigation tubing and instructions for use describing the channels for each model of endoscope. It is imperative that the staff realize that while endoscopes have many similarities there are variances as well. The availability of model specific instructions for use are necessary for successful cleaning.

A weak solution enzymatic cleaner may not break down proteins; a strong solution may produce sudsy bubbles that make up air pockets prohibiting surface contact of the chemical. Should the instructions indicate, the solution may need to be made with warm water or the chemical might be in a suspension and need to be shaken prior to use.

Should the solution come in a jug with a pre-measuring pump, a full depression of the pump with recovery time of the spring-loaded device is essential. Short pumps will release a smaller volume and a shorted recovery will not allow the next pump's delivery volume to be at full capacity.

Once an enzymatic chemical has been selected for departmental use, an indicator of fluid depth should be marked on the frequently used sinks. This will easily allow for a more accurate ratio of chemical to water to be achieved. The initial determination of sink depth can be made with an empty gallon container. Semi-permanent markings can be made with fluid resistant tape, permanent ink markers, engravers, or colored silicone caulk.

In order to prevent cross contamination, a fresh solution of enzymatic cleaner should be used to process each patient's scope(s). Enzymatic cleaners are not typically microbiocidal and may grow bacteria the longer they sit out. Cross contamination may be a result of cleaning products reused for multiple patient care items.

The internal scope channels must have contact with the enzymatic cleaner for effective cleaning. Scope manufacturers provide an irrigator that when appropriately connected to the scope allows for easy access to all internal channel surfaces. There are also electronic pumps that can be used to irrigate the scopes as well. Whichever method is used, manual or mechanical, it should also be used when rinsing the scope prior to high level disinfection. Failure to rinse the scope completely may reduce the effectiveness of the disinfection cycle.

The internal elevator wire channel and auxiliary water ports must have contact with the enzymatic cleaner for effective cleaning as well. The only method to effectively clean and reprocess these smaller channels is with the use of their special cleaning irrigation tubes.

The manual irrigator should also be used for rinsing to avoid mixing the enzymatic cleaner and the reprocessing chemicals. Failure to follow manufacturer guidelines both to the scope and the chemical can result in sever damage to the scope's protective covering. If the integrity of the protective covering is not intact, the scope cannot be effectively cleaned or disinfected.

All external surfaces of the scope should be cleaned with a soft cloth or sponge. Brushes tend to have bristles that may not be appropriate for the scope's exterior. If using sponges impregnated with enzymatic cleaners, they should be used in addition to, not instead of, a bath of mixed solution. While appropriately diluted for the scope's exterior, the dilution of activated chemicals may not be appropriate for the flow of fluid through the channels.

With the advent of dietary supplements and food products that are designed to bond fat in opposition to digesting it, scope soil evacuation may need to be reevaluated. In this situation, an enzymatic solution that breaks down fat may be needed to supplement the typical regimen followed for the removal of the more common protein debris.

Through flushing of the channels and rinsing of the flexible endoscope and its accessories with potable tap water removes residual debris and cleaning solutions. If the scope is to soak in a basin of disinfectant solution following manual cleaning, the water used to rinse the enzymatic solution needs to be removed from the scope. All water retained within the channels or on the outside of the scopes will dilute the concentration of the disinfectant solution reducing its effective concentration life span.

A larger sink will allow for easier brush delivery and solution flow as the scope can be placed in larger coils. A sink of a diagonal of less than 24 inches across will not only impede cleaning activities but can lead to channel kinks, angulations damages, and/or tube structure damages.

Personal protective equipment (PPE) should be selected to protect the user from the chemicals in use. Protective attire must be appropriate for the task being performed. PPE including fluid resistant gowns, face shields or goggles, and a fluid-resistant face mask. Gloves must not permit blood or other fluids to pass though to clothing, skin, mouth, eyes, or mucous membranes. Gloves should have cuffs long enough to prevent fluid to enter them as the arm moves. Some chemicals list gloves of specific materials, weight, and safe use periods.

A scope that has failed a leak test can be cleaned with a modified process. The general principle is to keep the scope pressurized while cleaning and/or soaking it in a chemical bath. Each scope manufacturer has guidelines specific to this occurrence.

Counter space or tray stacking systems for holding scopes that have not yet been leak tested, cleaned, and/or disinfected needs to be allocated and identified as to the status of the scopes awaiting attention.

Make rounds with the endoscopy manager and review the following:

- Is the enzymatic solution appropriate for flexible endoscopes?
- Is the enzymatic solution mixed according to label directions?
- Are cleaning brushes appropriate and in good condition?
- Are channel irrigators available and used?
- Is the sink's drain cover safe?
- What is the diameter of the sink used?
- Is the enzymatic solution changed with each patient's scope(s)?
- Is there a process in place to safely clean and externally disinfect the scope should a leak be determined?
- Is the sink marked to indicate fluid volume?
- Is appropriate personal protective equipment provided and worn?
- Are cleaning instructions for each scope posted or readily available?

High Level Disinfection

The minimal standard of care for flexible endoscopes is high level disinfection (HLD) based on their Spaulding

classification within the semi-critical category. However, should the endoscope be used on the sterile field or come in contact with sterile tissue or the vascular system (classified as critical), the endoscope should be sterilized before each use. Check with the endoscope's manufacturer for current and effective disinfection and/or sterilization parameters.

Effective cleaning must be achieved before hand. Successful disinfection is dependent upon the compatibility of the scope, chemical(s), and automated or manual reprocessor capabilities.

Chemicals selected for HLD should be approved for flexible endoscopes. Some chemicals used in the reprocessing of other medically and surgically used devices may cause damage to components of the flexible endoscopes. As chemicals are considered for use, their accompanying user information and Material Safety Data Sheets (MSDS) should first be reviewed. Each time a new chemical is introduced all persons involved should be educated as to the specifics of the new chemical.

There are a few environmental considerations that need to be addressed when using chemicals. Dispose of the container that stored the chemical according to label directions—some may indicate to rinse the empty container prior to disposal. Some areas of the country require the HLD to be neutralized prior to the primary chemical's disposal. A spill kit needs to be available in the area of use at all times. Appropriate personal protective equipment (PPE) should be made available and used conscientiously. An eye wash station should be located in the area of chemical use. Remember that many chemicals are activated by heat so the temperature of the water in the eye wash station needs to be regulated.

Regardless of which approved chemical is selected in order to achieve HLD, a consistent application of all parameters must be adhered to. These include concentration, temperature, exposure period, and rinse instructions. Should there be variables to the selected chemical's parameters, become aware of how one modification may alter another parameter, i.e. when selections for exposure period decrease the temperature required to achieve HLD usually goes up.

The outcome of HLD will only be achieved if all internal channels are flowed and all external surfaces are exposed to the disinfectant according to label parameters. Proper adapters must be connected appropriately to deliver the chemical and the scope is placed in the basin that allows for complete submersion. In situations where multiple scopes are in one bath, the height of the scopes may be above the surface level of the chemical and may not receive complete chemical exposure.

The minimal effective concentration of each disinfectant bath should be tested before each use according to the chemical's instructions. There are multiple brands and concentrations of the chemicals used for HLD and their chemical solution test strips and chemical monitoring devices can lead to confusion. When a chemical concentration indicator has been selected, the user should assure that it is appropriate to the disinfectant by brand and concentration that is being used. As an example, there are multiple brand name and generic glutaraldehydes with pH values from 3 percent to 3.3 percent. Two percent to 2.5 percent concentrations are commonly used in endoscopy practices. Should the chemical indicator not be advised for the concentration of solution in use, there may be false positive concentration checks.

Attention should be paid to the storage of the solution test strips and chemical monitoring devices as related to expiration date, exposure to temperature and humidity, as well as other retardants that may be identified by label information. Instructions for performing checks on the strips and monitors themselves need to be performed and recorded as well.

Whether manually or electronically logged, a method of tracking which devices reprocessed in which bath or automated unit (and cycle) as it relates to which patient should be maintained. If a need to retrospectively determine potential contamination arises, easy tracking needs to be in a system other than, or additional to, the patient's record.

In addition to the routine maintenance of an automated endoscope reprocessor, including flushing of the lines, diagnostic cycles, and filter changes, routine heating and air conditioning vent maintenance in the reprocessing area should also be maintained. Keep a log of these activities on file.

Following disinfection, removal of the chemical should be in accordance to the chemical label instructions. Sterile, filtered or unfiltered tap water followed by a 70 percent to 90 percent ethyl or isopropyl alcohol rinse and flush is instituted based upon the endoscope manufacturer's instructions for use. Failure to remove all chemicals externally and internally may result in chemical insult to the subsequent patient.

Those items that are without directed flow, i.e. medication atomizers or water bottles, may result in chemically related patient injuries if they are not cleaned and reprocessed according to their instructions for use. In general, because of their lack of directed flow, their safe reprocessing is not attainable in an automated endoscope reprocessor.

The final disinfection step is to dry the scope prior to the next use or storage. This occurs by flowing all of the scope's channels with air, instilling alcohol, and then air-drying the scope a second time. (See Figure 5.) Any moisture residual to the scope may become a medium for bacteria growth within a short period of time. In this era of antibiotic-resistant organisms and undiagnosed co-morbidities absolute dehydration of all moisture should be an imperative step. The amount of residual fluid, number and types of microorganisms, temperature, and ventilation are all variables that can impact bacteria growth. Many automated endoscope reprocessing units have a cycle that will accomplish this step.

Figure 5. Poor Contact of Disinfectant on Water Bottle

The air that is delivered to the scope, if not canned, should be metered by a gauge that is set below a detrimental capacity of the scope. To send substantial unregulated air pressure through the scope can cause tornado-like damage to the "O" ring seals and/or glue joints. This damage is enhanced when internal and undetectable contact damage had already occurred to the scope. The user manual that supports the processor used to insufflate the patient during the procedure will offer levels of air tolerance safe for the scopes in inventory. The range of tolerance will be given in pound per square inch (PSI).

If there is no outflow through the scope of pressurized air used to dry the scope's interior, air flow should be discontinued immediately and the scope evaluated for an obstruction.

Seventy percent to 90 percent isopropyl alcohol is an adjunct solution that facilitates internal lumen dehydration. The alcohol used should be stored in containers that are airtight. Should the solution be kept in an open container, its evaporative properties will disperse in the room's atmosphere and not be effective in dehydrating the scope.

Make rounds with the endoscopy manager and review the following:

- Are the employees wearing the correct PPE?
- Are manufacturer's recommendations for the chemicals used followed as they relate to concentration, time, temperature, exposure and rinses?
- Is there a log that tracks all disinfection processes?
- Are manufacture's recommendations for the automated reprocessor followed?
- Are solution test strips and chemical monitoring devices appropriate for the disinfectant used?
- Is the minimally effective concentration of the chemical being tested before each use?
- Is the chemical selected compatible with the endoscope?
- Is the endoscope compatible to the reprocessor?
- Are there stains on the floor of the storage area?
- Was the AER or manual soak allowed to be completed without interruption?
- Is forced air available near a clean counter?
- Is there an alternative disinfection process (and supplies) should there be a power outage?
- Is a spill kit available?
- Is an eye wash station at hand?
- Are air exchanges appropriate for the chemicals in use?
- Is the condition of the heating and air conditioning vents monitored?

In addition to these precepts as they relate to flexible endoscopes, a review of routine practices as they relate to the wearing and/or changing of gloves and gowns should be reviewed. Many times clean surfaces are contaminated because of lack of attention to the condition of the gloved hands touching them. These typically relate to distal tip scope protectors, lids and/or covers for disinfectant solutions, telephones, light switches, cabinet doors, drawer pulls, linen or garbage can lids, and writing tools. Renovations of the endoscopy area of practice or of those areas that might disrupt endoscopy care should also be reviewed as they too may impact the safe handling of the endoscope.

Alternatives for when typical persons in a job position are unexpectedly out or not available outside of routine endoscopy hours should also be addressed.

Summary

Flexible endoscopes may be found in several areas of your facility. They may include gastroenterology, respiratory, urology, anesthesia, general surgery, ENT, and/or radiation therapy. Rounds made with the managers of each area providing flexible endoscopy services that identify process improvement initiatives will lead to safer patient care outcomes within your facility, healthier staff, and a safe environment. ✛

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ANSWERS

1.	c	6.	a
2.	d	7.	c
3.	a	8.	d
4.	d	9.	a
5.	b	10.	d

Sterile Process and Distribution CEU Information

CEU Applicant Name _____

Address_____

City_____ State_____ Zip Code _____

The CBSPD (Certification Board for Sterile Processing and Distribution) has pre-approved this inservice for 1.5 contact hours for a period of five (5) years from the date of publication. Successful completion of the lesson and post test must be documented by facility management and those records maintained by the individuals until recertification is required. **DO NOT SEND LESSON OR TEST TO CBSPD.**

For additional information regarding Certification contact: CBSPD, 148 Main St., Lebanon, NJ, 08833 or call 908-236-0530 or 800-555-9765 or visit the Web site at www.sterileprocessing.org.

IAHCSMM has awarded 1.5 Contact Points for completion of this continuing education lesson toward IAHCSMM recertification.

Nursing CE Application Form

This inservice is approved by the California Board of Registered Nurses, CEP 5770 for 1 contact hour. This form is valid up to five (5) years from the date of publication.

1. Make a photocopy of this form.
2. Print your name, address and daytime phone number and position/title.
3. Add the last 4 digits of your social security number or your nursing license number.
4. Date the application and sign.
5. Answer the true/false CE questions. **KEEP A COPY FOR YOUR RECORDS.**
6. Submit this form and the answer sheet to:
   3M Sterilization Assurance, Attn HC4160
   RR Donnelly Fulfillment Services
   585 Hale Ave N, Oakdale, MN 55128-9935
7. For questions, contact craig@firstaccessmedia.com.
8. Participants who score at least 70% will receive a certificate of completion within 30 days of *healthVIE.com's* receipt of the application.

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